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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,532	10/28/2003	Naobumi Okada	03653/LH	6456

1933 7590 01/27/2011

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ART UNIT	**PAPER NUMBER**
3742	

MAIL DATE	DELIVERY MODE
01/27/2011	PAPER

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte Naobumi Okada

Appeal 2009-007131
Application 10/696,532
Technology Center 3700

Before: RICHARD E. SCHAFER, SALLY C. MEDLEY, and MICHAEL P. TIERNEY, *Administrative Patent Judges.*

SCHAFER, *Administrative Patent Judge.*

DECISION ON APPEAL

Applicant appeals the Final Rejection of Claims 1-36 under 35 U.S.C. § 103(a) as unpatentable over Baer[1] and Portney[2]. 35 U.S.C. §§ 6(b) and 134(a). We reverse.

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[1] U.S. Patent 6,639,657.
[2] U.S. Patent 4,842,782.

ANALYSIS

Subject Matter of the Claimed Invention

The claimed subject matter relates to a laser microdissection device and a method for laser microdissecting. A laser microdissection device is used to examine a sample of biological material, identify areas of the sample containing cells of interest and separate those areas for further analysis. Applicant refers to the portion of the sample including the cells of interest as the "necessary area." Applicant's device includes two essential parts: (1) a laser and (2) an optical system that directs the laser beam onto the sample. The laser is used to irradiate the sample and separate the necessary parts from the undesired "unnecessary" portions of the sample. The optical system includes an "active optical element" and an objective lens. The lens is located between the active optical element and the sample. The active optical element forms a pattern that delineates the identified necessary areas and acts as a mask that blocks irradiation of those areas. The objective lens focuses the laser on the unnecessary areas, vaporizing those parts resulting in separation of the necessary areas.

Claims 1-11, 30, and 32-36

Representative Claim 1(emphasis added) recites:

> 1. A microdissection apparatus comprising:
> a laser light source to emit laser light; and
> a laser light irradiation optical system to irradiate a sample with the laser light from the laser light source,
> wherein the laser light irradiation optical system comprises: (i) *an active optical element on which a variable pattern set to correspond to a necessary area is formed,* and (ii) an objective lens which is positioned between the active optical element and the sample; and

> wherein the laser is irradiated through the active optical element on which the variable pattern is formed, and guided to the sample by the objective lens so that a part of the sample excluding the necessary area is irradiated with the laser light.

Baer

Baer relates to a laser microdissection device and method for separating desired biological samples. Baer 1: 46-64. Baer's apparatus includes both a laser light source and an optical system for irradiating a sample with laser light. Baer 6:29-34. The optical system includes an objective or focusing lens 350 that guides the laser beam to the sample. Baer 6:32-34, Fig. 3. The lens 350 may include a variable aperture that changes the laser beam diameter. Baer 6:34-37.

Differences from Baer

The Examiner found that Baer did not teach, *inter alia*, a "pattern forming means." Ans., p. 3. We understand the Examiner's reference to a pattern forming means to refer to the active optical element having a pattern corresponding to the necessary area of the sample. The Examiner relies on Portney for the teaching of the use of a pattern-forming mask.

Portney

Portney discloses a laser device and method for cutting ophthalmic lenses from a blank piece of plastic material. Portney 1:35-42. The device includes a laser, a mask, and an objective lens that focuses the laser beam on to the plastic. Portney 2:58 – 3:9. The mask delineates the areas of the plastic to be cut by the laser while protecting the portions that will form the contact lens. Portney 1:43-51. Portney's Figs. 1 and 3 show an example of a lens cut from the plastic and the mask used to cut out the lens, respectively.

Portney 2:10-11 and 14-15. Different masks are substituted depending on the desired configuration of the lens. Portney 3:10-14.

Contentions

The Examiner held that it would have been obvious to employ the masks taught by Portney with Baer's device to ensure that the exact desired area is processed. Ans., p. 4.

Applicant responds, *inter alia*, that Portney discloses the use of multiple fixed masks rather than an active mask as required by Claim 1. Brief, p. 15. According to Applicant, the mask used in the claimed device and method has a variable, i.e. changeable, pattern. Applicant directs us to the liquid crystal displays and micro mirror arrays disclosed in the written description as examples of what Applicant means by "active optical element." Brief, p. 15.

Obviousness

We agree with Applicant's claim construction. The "active optical element on which a variable pattern is set to correspond to a necessary area is formed" refers to a reconfigurable or changeable mask rather than replaceable fixed masks as described by Portney. We interpret the quoted language as meaning an optic element with active components (i.e., capable of changing condition) that adjust to vary the pattern. Our interpretation is based on the claim, as a whole, and the Specification's repeated discussion of adjusting the active components of "active optic elements" (e.g., moving micro mirrors of an array) to vary a laser pattern. Written Description 13:10-18; 21:13-25; 22:24-23:7; 24:4-10; 24:27-5; 26:14-21; 33:20-27; 34:19-22; 35:23-36:24; 38:2-8.

The Examiner also identifies the "active optical element" as the objective lens 350 disclosed by Baer and noting that it may be "associated with structure for changing the beam diameter such as, for example, a variable aperture." Ans. 14. Baer does not describe and the Examiner has not explained how the aperture is associated with the lens. In any event, it appears that the aperture is used to vary the size of the laser beam to control its intensity rather than to select the area to be illuminated. Baer, 6:34-36. Selection of the area to be illuminated is done using the translation stage 145. Baer 5:30-47.

Based upon the combined teachings of the references before us, the use of a reconfigurable mask of the type required by Claim 1 in Baer's device has not been shown to have been obvious. We therefore reverse the rejections of Claim 1 and its dependent Claims 11, 30, 32-36.

Claims 23-29, 31

Claim 23 (emphasis added) is directed to a method:

> 23. A microdissection method comprising:
> *forming a variable pattern on an active optical element such that the pattern is set to correspond to a necessary area of a sample*; and
> irradiating the active optical element with laser light; and
> guiding the laser light from the active optical element to the sample, via an objective lens positioned between the active optical element and the sample, so as to irradiate a part of the sample excluding the necessary area with the laser light.

Similarly to Claim 1, Claim 23 requires the step of "forming a variable pattern on an active optical element such that the pattern is set to correspond to a necessary area." For the reasons we stated above with

respect to Claim 1, we construe the above quoted limitation to require the use of a reconfigurable mask rather than multiple fixed masks. For the reasons already stated with respect to the subject matter of Claim 1, the use of a reconfigurable mask in the process described by Baer has not been shown to have been obvious from Baer and Portney. We reverse the rejection of Claims 23 and its dependent Claims 24-29 and 31.

Claims 12-22

These claims are also directed to a microdissection a device, but the subject matter is described using means plus function language (emphasis added):

> 12. A microdissection apparatus comprising:
> a light source means for emitting laser light; and
> a laser light irradiation optical system to irradiate a sample with the laser light from the light source means;
> wherein the laser light irradiation optical system comprises: (i) *pattern forming means for transmitting or reflecting the laser light selectively in accordance with a variable pattern which is set to correspond to a necessary area*, and (ii) an objective lens which is positioned between the pattern forming means and the sample; and wherein the laser light is irradiated to the sample through the variable pattern formed by the pattern forming means, and guided to the sample by the objective lens so that a part of the sample excluding the necessary area is irradiated with the laser light.

Applicant notes that these claims use the means plus function format and are subject to mandatory construction of 35 U.S.C. § 112, ¶ 6. Brief, p. 32.

Claim 12 includes the limitation "pattern forming means for transmitting or reflecting the laser light selectively in accordance with a variable pattern which is set to correspond to a necessary area." The

disclosed structure corresponding to the "pattern forming means" is the transmission liquid crystal displays and the reflective micro mirror arrays used to mask the necessary areas from the laser beam. Neither Baer nor Portney describe these structures or their equivalents. On the record argued before us, we fail to see a reason for modifying Baer's device by including a transmission liquid crystal display, a reflective micro mirror array or their equivalents. Thus, the subject matter of Claim 12 has not been shown to have been obvious.

We reverse the rejection of Claim 12 and its dependent claims 13-22.

DECISION

The Examiner's rejection of the subject matter of Claims 1-36 under 35 U.S.C. § 103(a) is reversed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, or for filing a request for rehearing, as recited in 37 C.F.R. § 41.52, begins to run from the "MAIL DATE" (paper delivery mode) or the "NOTIFICATION DATE" (electronic delivery mode) shown on the PTOL-90A cover letter attached to this decision.

REVERSED

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